Patent claims

1. A ball bearing (1) with a bearing ring (3, 4) and with a cage (5, 35) and also with at least one run-on surface (15) on the bearing ring (3, 4), the cage (5, 35) being provided with pockets (9, 41) which are adjacent one another peripherally about an axis of rotation (1a, 35a) of the ball bearing (1) and each of the pockets (9, 41) thereby being at least partly delimited in an axial first direction, in the same direction as the axis of rotation (1a, 35a), by a first flange (11, 36) and in at least one second direction, counter to the first direction, by a second flange (12, 37), and at least one of the flanges (11, 12, 36, 37) being delimited in a radial direction by a radial guiding surface (14, 45) and the guiding surface (14, 45) thereby lying at least radially opposite the run-on surface (15), characterized in that radial distances (20a, 20b, 20c) between the axis of rotation (1a, 35a) and the run-on surface (15) that define the path of the run-on surface (15) become smaller as they become increasingly axially remote from a furthest distance (20) between the axis of rotation (1a, 35a) and the run-on surface (15), so that the run-on surface (15) slopes down in relation to the axis of rotation (1a, 35a)

in an imaginary longitudinal section viewed along the axis of rotation (1a, 35a).

2. The ball bearing as claimed in claim 1, characterized in that the distances (20a, 20b, 20c) between the axis of rotation (1a) and the run-on surface (15) become smaller as they become increasingly axially remote from a center of the pocket (9a).

3. The ball bearing as claimed in claim 1, characterized in that the distances (20a, 20b, 20c) between the axis of rotation (1a) and the run-on surface (15) become smaller as they become decreasingly axially remote from a center of the pocket (9a).

4. The ball bearing as claimed in one of claims 1, 2 or 3, characterized in that the guiding surface (14) is aligned in the axial directions (10) parallel to the axis of rotation (1a).

5. The ball bearing as claimed in one of claims 1, 2 or 3, characterized in that, starting from a smallest distance (22) of a contour line (21) of the guiding surface (14) that is radially closest to the axis of rotation 1a, the

radial distances (22a, 22b, 22c) between the axis of rotation (1a) and the guiding surface (15) that describe the path of the guiding surface (14) become greater as they become increasingly axially remote from the smallest distance (22) by the amount by which the radial distances (20a, 20b, 20c) between the run-on surface (15) and the axis of rotation (1a) become smaller.

6. The ball bearing as claimed in claim 1, characterized in the guiding surface (14, 45) is facing radially outward and the run-on surface (15) is facing radially inward.

7. The ball bearing as claimed in claim 6, characterized in that the contour line (24) of the guiding surface (14) that lies radially closest to the axis of rotation (1a, 35a) is radially further away from the axis of rotation (1a, 35a) than a radially outermost contour (19) of the second flange (12) radially furthest away from the axis of rotation (1a, 35a).

8. The ball bearing as claimed in claim 7, characterized in that the ball bearing (1) is an angular-contact ball bearing (2), the bearing ring (3) enclosing the cage (5) and thereby having a first shoulder (8), with the

annularly formed run-on surface (15), and also a second shoulder (7), the second shoulder (7) lying radially opposite the second flange (12).

9. The ball bearing as claimed in claim 8, characterized in that a smallest possible radial gap size between the guiding surface (14) and the run-on surface (15) is greater than zero, the smallest possible radial gap size being a smallest operating play between the rotating cage (5) in an operating state of the ball bearing (1).

10. The ball bearing as claimed in claim 9, characterized in that the gap size is formed in a size equal to or greater than four micrometers to equal to or greater than eight micrometers.

11. The ball bearing as claimed in claim 8, characterized in that the cage (5, 35) is made of plastic and in that the guiding surface (14, 45) has, at least in the peripheral direction of the cage (5, 35) radial, spaced-apart depressions (47).

12. The ball bearing as claimed in claim 8, characterized in that the cage (5, 35) is made of plastic and in that at

least the second flange (12) has a sub-portion (25) of an inner surface of an imaginary hollow cylinder (26) that is directed into the pocket (9), and in that a pocket angle between the center axis (9a) of the hollow cylinder (26) and an imaginary line (27) perpendicular in this case to the axis of rotation (1a) is less than the contact angle between the line (27) and between a contact line (29) of the angular-contact ball bearing (2), the perpendicular line (27) and the contact line (29) intersecting the ball (28) at the center (32) and thereby the contact line (29) intersecting the axis of rotation (1a) at an acute angle.

13. The ball bearing as claimed in claim 12, characterized in that the sub-portion (25) of the inner surface delimiting the pocket (9) is an inner surface of the hollow cylinder (26) running around annularly in the pocket (9).

14. The ball bearing as claimed in claim 13, characterized in that a pocket angle between the center axis (9a) of the hollow cylinder (26) and an imaginary line (27) perpendicular in this case to the axis of rotation (1a) is less than the bearing contact angle between the line (27) and a contact line (29) of the angular-contact ball

bearing (2), the perpendicular line (27) and the contact line (29) intersecting the ball (28) at the center (32) and thereby the contact line (29) intersecting the axis of rotation (1a) at an acute angle.

15. The ball bearing as claimed in claim 8, characterized in that at least a free distance (31) between two mutually opposite further sub-portions (30) of the pocket (9) is less than a smallest possible diameter of a ball (28) in the pocket (9), the free distance (31) being at a greater distance away from the axis of rotation (1a) than the center (32) of the ball (28).

16. The ball bearing as claimed in claim 15, characterized in that at least a sub-portion (25) of an inner surface delimiting the pocket (9) is a surface portion of a hollow cylinder (26) running around annularly in the pocket, the surface portion going over into a further sub-portion (30) of the inner surface and the further sub-portion (30) thereby having the inner lateral surface of an imaginary hollow truncated cone, and the inside diameter (31) describing the hollow truncated cone at the inwardly narrowest point being the free distance (31).

17. The ball bearing as claimed in claim 8, characterized in that the cage (35) is made of plastic and the first flange (36) is radially offset in relation to the second flange (37) to such an extent that the radially outermost contour 38 of the second flange (37), radially furthest away from the axis of rotation, and a radially innermost inner contour (39) of the first flange (36), lying closest to the axis of rotation, together abut an imaginary parting plane (40) in the direction of the axis of rotation (35a), the parting plane (40) radially dividing the pocket (41) from the first flange (36) to the second flange (37), and in that the parting plane (40) is kept radially at a distance from a pitch radius (42), the pitch radius (42) describing a common pitch circle of the angular-contact ball bearing (2) taken through the centers (32) of the balls (28) in the pockets (41).

18. The ball bearing as claimed in claim 8, characterized in that the cage (5, 35) is recessed at the first flange (11, 36), on a side (44) facing away from the pocket (9, 41) and axially terminating the cage (5, 35), axially in the direction of the pocket (9, 41) and, at the guiding

surface (14, 45), radially in the direction of the axis of rotation (1a, 35a).

19. The ball bearing as claimed in claim 18, characterized in that the cage (5) has a bevel (34), running around the axis of rotation (1a), between the guiding surface (14) and the side (33).

20. The ball bearing as claimed in claim 18, characterized in that the cage (35) has a channel (46), running around the axis of rotation (35a), between the guiding surface (45) and the side (44).

21. An angular-contact ball bearing (2) with a bearing ring (3) and a cage (5) and also with at least one annularly formed run-on surface (15) on the bearing ring (3), the cage (5) being provided with pockets (9) which are adjacent one another peripherally about an axis of rotation (1a) of the cage (5) and each of the pockets (9) thereby being at least partly delimited in an axial first direction, in the same direction as the axis of rotation (1a), by a first flange (11) and in at least one second direction, counter to the first direction, by a second flange (12), and at least the first flange (11) being

delimited in a radial direction by a radial guiding surface (14) and the guiding surface (14) thereby lying at least radially opposite the run-on surface (15) and the second flange (12) thereby lying at least radially opposite a shoulder (8) on the bearing ring (3), characterized in that a smallest possible radial gap size between the guiding surface (14) and the run-on surface (15) is greater than zero, the smallest possible radial gap size being a smallest operating play between the rotating cage (5) in an operating state of the angular-contact ball bearing (2), and in that the gap size is less than a smallest possible further radial gap size between the second flange (12) and the shoulder (8).

22. The ball bearing as claimed in claim 21, characterized in that the gap size is formed in a size equal to or greater than four micrometers to equal to or greater than eight micrometers.

23. The ball bearing as claimed in claim 21, characterized in that the cage (5) is made of plastic and in that the guiding surface (14) has, at least in the peripheral direction of the cage (5) radial, spaced-apart depressions (47).